

ABSTRACT OF THE INVENTION

A method for producing a diffraction grating is provided. First, a mixture including nematic liquid crystal, dopant, and polymerizable precursor is introduced between two electrically conductive substrates having alignment layers for inducing orientation of the liquid crystal director. A potential difference is applied across the liquid crystal to cause a spontaneous self-assembly of the liquid crystal into an array of convective rolls. Thereafter, the roll structure is stabilized by the creation of a polymeric network through polymerization and/or cross-linking of the polymerizable precursor. The convective roll structure serves as a template for the formation of the polymeric network.